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Dynamics within alkylsiloxane SAMs studied by sensitive dielectric spectroscopy[1] MARY SCOTT, DERRICK STEVENS, JASON BOCHINSKI, LAURA CLARKE, North Carolina State University, Raleigh, NC 27695 — Self assembled monolayers (SAMs) are a ubiquitous tool in modern research and their static structure has been extensively studied. Fewer investigations have addressed dynamics within these systems; however, such motions within SAMs will affect surface properties such as friction and blocking ability (permeability). In this study, sensitive, dielectric spectroscopy over a broad temperature range (4-400 K) has been employed to study relaxations within planar alkylsiloxane SAMs[1] . Highly disordered SAMs of varying density were grown by vapor deposition. Two dielectric relaxations were observed. The first, a polyethylene-like relaxation similar to that previously reported in phase-segregated alkyl side-chain polymers, is observed for all films with alkyl chains containing four or more carbons. This is an interacting or glassy relaxation. The second motion, which is observable only at high film densities, is a local mode, which follows an Arrhenius dependence on temperature, and has been previously assigned to a sub-chain rotation. [1] M.C. Scott, D.R. Stevens, J.R. Bochinski, L.I. Clarke, ACS Nano. DOI: 10.1021/nn800543j.

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